Remarks

The undersigned's Remarks are preceded by related comments of the Examiner, presented in small bold-faced type.

1. Numbering of claims is not in accordance with 37 CFR 1.126. . . .

The claims have been amended to include proper numbering. In particular, misnumbered claims 17-32 have been renumbered as claims 16-31, respectively.

1. Claims 10 recites the limitation "...predetermined selection critiera" in line 5. There is insufficient antecedent basis for this limitation.

The dependency cross-reference in claim 10 has been fixed.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 6,417,865 to Bou.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bou in view of U.S. Patent No. 5,237, 647 to Roberts et al (Roberts).

4. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bou in view of Roberts . . . .

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bou as applied to claim 1 above in further in view of Schlieve, "Illustrated AutoCAD Release 11" (Schlieve)

The Examiner's rejection is respectfully traversed. Contrary to the Examiner's suggestion, Bou does not teach mirroring a component where such mirroring includes reproducing a component in a preferred orientation as claimed in the present application, nor does Bou teach "creating a new component of the three-dimensional object that is the

reproduction of the first component in the preferred orientation." Nor does Bout teach that the new component is created "based on a position of the first component with respect to a surface said surface comprising a plane of symmetry positioned in the three-dimensional modeling space and wherein said surface is not a component of the three-dimensional object.".

It is respectfully submitted that Bou teaches something quite different from what is claimed in the present application. In particular, Bou teaches the automated placement of an already created object; this is different from "mirroring," which is what is claimed in the present application.

Bou is understood as disclosing that an active object can be placed with respect to an affinity object based on the placement of an object similar to the active object with respect to an object similar to the affinity object. In other words, Bou is understood as teaching a system that automatically provides similar positioning for similar objects (see, e.g., Bou column 5 line 24-49 disclosing that a light switch object "placed" on a wall object will be automatically positioned based on other light switch objects placed on other wall objects). This is not a "computer-implemented method of mirroring a component" as recited by claim 1. Accordingly, since Bou does not teach mirroring of components, it is respectfully submitted that Bou is not even relevant as prior art to the claimed inventions.

In Bou's system, a database is searched for example relationships between two objects (see column 4, lines 13-16). Using one or more of the example relationships, Bou specifies a placement for the active object (which is similar to one of the two objects) in a similar positional pattern to the affinity object (which is similar to the other of the two objects). Basically, Bou looks in a database to determine if there is a predefined positional relationship between objects and, when two objects of that type are added to a drawing (i.e., a first and a second object, also referred to in Bou as the active and affinity objects), Bou uses the positional relationship information from the database to position the first object with respect to the second object.

The "method of mirroring a component" recited in, e.g., claim 1 of the present application is different. The claimed method of mirroring is not directed to the positioning of an active object with respect to an affinity object as disclosed in Bou. Mirroring, as disclosed and claimed in the

present application, has a different purpose – i.e., it is directed to the process whereby objects are created rather than Bou's process whereby objects are positioned. By way of example, consider an exemplary CAD/CAM system employing the mirroring function of the present application. Using such a CAD/CAM system, a user can create the mechanical assembly 204 shown in Fig. 3 of the present application. The mirroring function disclosed in the present application can then be invoked to "mirror" part 204 with respect to the plane 310 so as to create the assembly 420 shown in Fig. 4. In this case, the end result of "mirroring" is that new model components (i.e., 422, 424, 426, 428) are created and integrated into the model 420. Bou simply lacks any disclosure of a "mirroring" feature whereby components are created. In short, Bou's positioning is not creation.

Furthermore, Bou does not disclose creation of a new component based on the position of a surface where said surface comprises a plane of symmetry that is not a component of the three dimensional object being modeled. This surface is shown, for example, as the surface 310 in Fig. 3 of the present application. As disclosed in the present application, the surface 310 is not a part of the object being modeled 204. Bou appears to provide positioning based only on objects that are part of what is being modeled (e.g., a light switch and a wall, which would both constitute parts of an object being modeled).

For at least the independent reason that (i) Bou is not relevant prior art; (ii) Bou does not teach or suggestion the creation of a new component based on a surface comprising a plane of symmetry, and (iii) Bou does not teach or suggest use of a plane of symmetry that is not a component of the three-dimensional object modeled in a computer-simulated three-dimensional modeling space, it is respectfully submitted that the rejection of claim 1 in light of Bou is improper. In addition, the combination of features recited by claim 1 are not taught or suggested by the Roberts and Schlieve references cited by the Examiner with respect to claims 4-8. Accordingly, it is respectfully requested that the Examiner withdraw his rejection of claim 1 and allow the claim.

Claims 4-6 and 8 depend from claim 1 and are patentable for at least the reasons stated with respect to claim 1.

6. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of U.S. Patent No. 6,323,859 to Grantt.

7. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Grantt as applied to claim 12 above further in view of Bou.

8. Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Grantt as applied further in view of Bou. . . .

9. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Grantt in view of U.S. Patent No. 6,212,484 to Chen further in view of Elliott et al, "Inside 3D Studio Max 3" (Elliot).

Claim 12 has been amended to clarify that one of the plurality of geometrically transformed components is used in the construction of the reproduction such that the first component and reproduction are symmetrical. This aspect of the invention is not taught or suggested by Roberts in view of Grantt. Nor are these features, as recited within the context of claim 12, understood to be taught or suggested by the other prior art references cited by the Examiner. Accordingly, it is respectfully submitted that claim 12, and its dependent claims 13-14, 18, 21, are allowable over the cited prior art.

10. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bou in view of Wang.

Claim 25 recites calculating orientations with respect to a plane of symmetry, wherein said plane of symmetry is not a component of the constructed three-dimensional object. As explained with respect to claim 1, supra, Bou does not teach calculating with respect to a plane of symmetry that is not a component of the constructed three-dimensional object. As was furthered explained, supra, what Bou teaches is determining a positional relationship between a proximate object and an object similar to an active object can suggest the placement of the active object to a proximate object or an object similar to a proximate object. Bou teaches the traversal of an object list to find the example relationships (Column 6, lines55-58). Bou further describes examination of a database to search for similar objects attached to the same of similar affinity object (see

column 4, lines 11-16). The search results are used as placement examples for the active object (see column 4, lines 26-27). Bou does not teach calculating a plurality of orientations for a component with respect to a plane, as does the present invention.

Claim 25 has been further amended to clarify that the term "deviation" refers to a "standard deviation." Although Bou teaches that the relationships are ranked according to their similarity, Bou does not teach that a plurality of standard deviation values are calculated. Rather, location to an active object, time of selection, or user nomination can be the basis of the similarity (see Column 5, lines 61-67). Moreover, while Wang does discuss reflected vertices, Wang does not teach that the one deviation value is computed for the plurality of vertices of each one of the plurality of orientations and the plurality of reflected vertices. In summary, neither Bou nor Wang teach or suggest the computation of one of the plurality of orientations for a first component with respect to a plane nor teach or suggest the computation of a plurality of deviation values.

Bou does not describe the computation of one of the plurality of standard deviation amounts equal to a result considered zero nor does Bou disclose the computation of the plurality of standard deviation amounts equal to a result considered non-zero and the construction of the first reproduction by reflecting the first component.

Since neither Bou nor Wang teach or suggest all of the elements of claim 25. Accordingly, it is submitted that claim 25 is allowable over the combination of Bou and Wang and it is respectfully requested that the Examiner withdraw the rejection of these claims and allow the claim.

Claims 27-28 depend from claim 25 and are allowable for at least the reasons stated with respect to claim 25.

12. Claims 7, 9, 15-17, 19, 20, 22-24, and 29-31 ... would be allowable if rewritten in independent form ...

The undersigned would like to thank the Examiner for the indication of allowable subject matter.

Conclusions

Claims 1, 7, 9-12, 15, 17-32 have been amended. Claims 1-31 are now pending and believed to be in condition for allowance. Applicant respectfully requests that all pending claims be allowed.

Please apply any credits or excess charges to our deposit account number 50-0521.

Respectfully submitted,

Date: February 19, 2004

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